

MARCH 9, 2018

**AMENDED NOTICE OF FUNDING OPPORTUNITY (NOFO) FOR
NIST PUBLIC SAFETY INNOVATION ACCELERATOR PROGRAM (PSIAP) – POINT
CLOUD CITY**

AMENDMENT 1

The National Institute of Standards and Technology (NIST) is amending its January 5, 2018 Notice of Funding Opportunity (NOFO) that solicits applications for the NIST Public Safety Innovation Accelerator Program – Point Cloud City (2018-NIST-PSIAP-PC2).¹

NIST is issuing this amendment (Amendment 1) to the NOFO to provide updates and clarifications:

- 1) The application deadline is extended to 11:59 p.m. Eastern Time, April 20, 2018, the date of a Grants.gov system closure in March is added, and the earliest start date for awards is adjusted to the new application deadline. The Table of Contents is revised. (See # A, E, and M below);
- 2) The anticipated funding amount is increased to up to \$1,000,000. (See # B and I below);
- 3) Clarifying details are added to the eligibility criteria. (See # C and J below).;
- 4) NIST will hold an additional webinar to provide general information about the amended NOFO, and a link to scheduling information is provided. (See # D and R below);
- 5) Details of desired research outputs are added to Section I.2. (See # F, G, and H below);
- 6) Corrections are made to the order and titles of the object class categories in the Budget Narrative. (See # K below);
- 7) Directions are updated for verifying that required documents are attached to the submission. (See # L below);
- 8) Detail is added to the Evaluation Criteria. (See # N, O and P below); and
- 9) The current continuing resolution funding NIST is cited. (See # Q below).

The changes are detailed in the table below.

¹ All page number references are to the full text of the Amended NOFO, including the revisions being made with this amendment.

#	New Page	Section	What does the amendment do?	The new paragraph(s) now read.
A	10	Executive Summary	The amendment changes the application deadline; the Grants.gov system closure dates; and the earliest start date for awards.	<p>Dates: Electronic applications must be received at Grants.gov no later than 11:59 p.m. Eastern Time, Friday, April 20, 2018. Applications received after this deadline will not be reviewed or considered. Paper applications will not be accepted.</p> <p>Applicants should be aware, and factor in their application submission planning, that the Grants.gov system is expected to be closed for routine maintenance from 12:01 a.m. Eastern Time, Saturday, March 17, 2018 until 6:00 a.m. Eastern Time, Monday, March 19, 2018.</p> <p>Applications cannot be submitted when Grants.gov is closed. NIST expects to complete its review, selection of successful applicants, and award processing by June 2018. NIST expects the earliest start date for awards under this NOFO to be August 1, 2018.</p>
B	11	Executive Summary	The amendment changes the anticipated funding amount.	<p>Anticipated Amounts: In FY2018, NIST anticipates up to \$1,000,000 may be available to fund awards in the range of \$50,000 to \$500,000 total with project performance periods of up to one (1) year.</p>

#	New Page	Section	What does the amendment do?	The new paragraph(s) now read.
C	11	Executive Summary	The amendment clarifies part of the eligibility information.	All awards listed in this NOFO are open to U.S. state, local and tribal governments and their official public safety organizations. Institutions of higher education and campus public safety departments are not eligible to apply. However, an eligible organization may propose to work individually or to include proposed sub-awardees, contractors or other collaborators to include institutions of higher education and their public safety departments, non-profit organizations, for-profit organizations, and hospitals. Public-private partnerships are encouraged. Although Federal entities are not eligible to receive funding under this NOFO, they may participate as unfunded collaborators.
D	12	Executive Summary	The amendment gives notice that a webinar will be scheduled to provide general information about the amended NOFO.	NIST hosted a webinar to provide general information regarding this NOFO, offer general guidance on preparing applications, and answer questions. A second webinar to provide general information regarding the amended NOFO will be hosted by NIST. Scheduling details about the second webinar will be available at pscr.gov .
E	13	Executive Summary	The Table of Contents has been updated to reflect changes to the document.	See <i>new</i> Table of Contents

#	New Page	Section	What does the amendment do?	The new paragraph(s) now read.
F	15	Section I.2., seventh paragraph	The amendment adds “simultaneous 360° imagery” to datastore(s).	A desired output of the research funded under this NOFO is a datastore or datastores of 3D point clouds and simultaneous 360° imagery annotated with public safety relevant objects ² , building information, and any other data that may be collected and annotated to enable additional R&D related to indoor localization and navigation, as well as other novel indoor location-based services. Once created, the datastore(s) will be used to accelerate R&D related to areas including, but not limited to:
G	16	Section I.2., tenth paragraph.	The amendment adds a new paragraph with specifics regarding simultaneous images from a 360° panoramic camera.	In addition to the 3D point clouds, applicants must also capture simultaneous timestamped images from a 360° panoramic camera so that: 1) the point clouds and images may be integrated to present realistic color, and 2) to enable future users of the dataset to perform their own feature extraction and object classification using either the raw imagery or point cloud data.
H	16	Section I.2., twelfth paragraph.	New detail has been added on future contributions to the data set and its purposes.	Applicants must consider both the information security of the data generated in the project and the safety of building occupants when operating the LiDAR equipment. Applicants must also address how

² See the National Alliance for Public Safety GIS [symbol library](#) for a catalog of public safety relevant objects.

#	New Page	Section	What does the amendment do?	The new paragraph(s) now read.
				<p>the data will be stored, managed, and distributed, as well as how feasible it will be for others to make future contributions to the data set, e.g. adding additional buildings or annotations. Further, to assist PSIAP with generating metrics to understand and demonstrate the value of the outputs created from PSIAP-PC2 to the R&D and public safety communities, applicants must describe any use of licensing (e.g., Creative Commons, Open Data Commons, etc.), citations and persistent identifiers, page views, downloads, or other means of measuring research impacts. In addition, applicants must address laser safety issues associated with the chosen LiDAR equipment and how they plan to notify building stakeholders and occupants about safety and privacy aspects of the survey and data collection process.</p>
I	18	Section II.2.	The amendment increases the potential available funding from \$500,000 to \$1,000,000.	In FY2018, NIST anticipates up to \$1,000,000 may be available to fund awards in the range of \$50,000 to \$500,000 total with project performance periods of up to one (1) year.
J	18	Section III.1., first paragraph	The amendment clarifies part of the eligibility information.	All awards listed in this NOFO are open to U.S. state, local and tribal governments and their official public safety organizations. Institutions of higher education and campus public safety departments are not eligible to apply. However, an eligible organization may propose to work individually or to include proposed sub-awardees,

#	New Page	Section	What does the amendment do?	The new paragraph(s) now read.
				<p>contractors or other collaborators to include institutions of higher education and their public safety departments, non-profit organizations, for-profit organizations, and hospitals. Public-private partnerships are encouraged. Although Federal entities are not eligible to receive funding under this NOFO, they may participate as unfunded collaborators.</p>
K	22-23	IV.2.a.(9)	<p>The amendment corrects the order and title of object class categories (c), (d), and (f), and adds object class category (g) in the Budget Narrative.</p>	<p>(g) Construction. Applications to PSIAP-PC2 may not include construction costs as part of their budget.</p>
L	25-26	IV.2.b.	<p>The amendment provides updated guidance for verifying the attachment of required documents to applications.</p>	<p>Applicants are strongly advised to use Grants.gov's "Download Submitted Forms and Applications" option to check that their application's required attachments were contained in their submission.</p> <p>After submitting the application, follow the directions found at this link, https://www.grants.gov/help/html/help/Applicants/CheckApplicationStatus/Download_Submitted_Forms_and_Applications.htm in the Grants.gov Online Users Guide. If the directions found at https://www.grants.gov/help/html/help/Applicants/CheckApplicationStatus/Download_Submitted_Forms_and_Applications.htm</p>

#	New Page	Section	What does the amendment do?	The new paragraph(s) now read.
				<p><u>d Applications.htm</u> are not effective, please contact the Grants.gov Help Desk immediately. If calling from within the United States or from a U.S. territory, please call 800-518-4726. If calling from a place outside the United States or a U.S. territory, please call 606-545-5035. E-mails should be addressed to support@grants.gov. Assistance from the Grants.gov Help Desk will be available around the clock every day, with the exception of Federal holidays. Help Desk service will resume at 7:00 a.m. Eastern Time the day after Federal holidays.</p>
M	27	IV.4.	<p>The amendment changes the application deadline; the Grants.gov system closure dates; and the earliest start date for awards.</p>	<p>Electronic applications must be received at Grants.gov no later than 11:59 p.m. Eastern Time, Friday, April 20, 2018. NIST will consider the date and time recorded by Grants.gov as the official submission time. Applications received after this deadline will not be reviewed or considered. Paper applications will not be accepted.</p> <p>Applicants should be aware, and factor in their application submission planning, that the Grants.gov system is expected to be closed for routine maintenance from 12:01 a.m. Eastern Time, Saturday, March 17, 2018 until 6:00 a.m. Eastern Time, Monday, March 19, 2018.</p> <p>Applications cannot be submitted when Grants.gov is closed. NIST</p>

#	New Page	Section	What does the amendment do?	The new paragraph(s) now read.
				expects to complete its review, selection of successful applicants, and award processing by June 2018. NIST expects the earliest start date for awards under this NOFO to be August 1, 2018.
N	31	V.1.a.(3)	The amendment adds “and imagery” to subsection (3).	(3) The number of buildings and the amount, diversity, and quality of the 3D point cloud and imagery data that will be collected and annotated, and the potential impact for accelerating R&D related to indoor mapping, localization, and navigation.
O	31	V.1.b.(1)	The amendment clarifies subsection (1).	(1) The extent to which the outputs will be available, traceable, and extendable for the public safety and R&D communities in usable format(s) and datastore(s).
P	32	V.1.d.(1)	The amendment expands upon subsection (1).	(1) The relevance and the appropriateness of the qualifications and experience of the key personnel and technical experts participating in the project, and the likelihood that they will be able to fulfill the objectives of this NOFO, including participation in the GCTC program.
Q	35	VI.2.d.	The amendment cites the current continuing resolution funding NIST.	d. Funding Availability and Limitation of Liability. NIST is funding the program listed in this NOFO from the proceeds of the Public Safety Communications and Electromagnetic Spectrum Auction conducted pursuant to Title VI of the Middle Class Tax Relief and Job Creation Act of 2012, Public

#	New Page	Section	What does the amendment do?	The new paragraph(s) now read.
				<p>Law 112-96 (Feb. 22, 2012). However, NIST issues this notice subject to the appropriations made available under the current continuing resolution funding the Department of Commerce, the Bipartisan Budget Act of 2018, Title IV, Subdivision 3, Section 20101 of Public Law 115-123, February 9, 2018. NIST anticipates making awards for the program listed in this notice provided that funding for Fiscal Year 2018 is continued beyond March 23, 2018, the expiration of the current continuing resolution.</p>
R	48	VIII.2.	<p>The amendment gives notice that a webinar will be scheduled to provide general information about the amended NOFO.</p>	<p>NIST hosted a webinar to provide general information regarding this NOFO, offer general guidance on preparing applications, and answer questions. A second webinar to provide general information regarding the amended NOFO will be hosted by NIST. Scheduling details about the second webinar will be available at pscr.gov.</p>

January 5, 2018, as revised March 9, 2018

**NOTICE OF FUNDING OPPORTUNITY (NOFO)
NIST Public Safety Innovation Accelerator Program (PSIAP) – Point Cloud City**

EXECUTIVE SUMMARY

- **Federal Agency Name:** National Institute of Standards and Technology (NIST), United States Department of Commerce (DoC)
- **Funding Opportunity Title:** NIST Public Safety Innovation Accelerator Program – Point Cloud City
- **Announcement Type:** Initial
- **Funding Opportunity Number:** 2018-NIST-PSIAP-PC2
- **Catalog of Federal Domestic Assistance (CFDA) Number:** 11.609, Measurement and Engineering Research and Standards
- **Dates:** Electronic applications must be received at Grants.gov no later than 11:59 p.m. Eastern Time, Friday, April 20, 2018. Applications received after this deadline will not be reviewed or considered. Paper applications will not be accepted.

Applicants should be aware, and factor in their application submission planning, that the Grants.gov system is expected to be closed for routine maintenance from 12:01 a.m. Eastern Time, Saturday, March 17, 2018 until 6:00 a.m. Eastern Time, Monday, March 19, 2018.

Applications cannot be submitted when Grants.gov is closed. NIST expects to complete its review, selection of successful applicants, and award processing by June 2018. NIST expects the earliest start date for awards under this NOFO to be August 1, 2018.

Applicants are strongly urged to read Section IV.2.b. Attachment of Required Application Documents of this NOFO with great attention. Applicants should carefully follow the instructions and recommendations regarding attachments and use the Download Submitted Applications feature on www.grants.gov to check that all required attachments were contained in their submission. Applications submitted without the required documents will not pass the Initial Administrative Review, described in Section V.3.a. of this NOFO.

When developing the submission timeline, please keep in mind that: (1) all applicants are required to have a current registration in the electronic System for Award Management (SAM.gov); (2) the free annual registration process in the SAM.gov (see Section IV.3. and Section IV.7.a.(1).(b) of this NOFO) often takes between three and five business days and may take as long as two weeks; (3) electronic applicants are required to have a current registration in Grants.gov; and (4) applicants using Grants.gov will receive e-mail notifications over a period of up to two business days as the application moves through intermediate systems before the applicant learns via a validation or rejection notification whether NIST has received the application. (See grants.gov for full information on application and notification through Grants.gov). Please note that a federal assistance award cannot be issued if the designated recipient's registration in the System for Award Management (SAM.gov) is not current at the time of the award.

- **Application Submission Address:** Applications must be submitted using Grants.gov.
- **Funding Opportunity Description:** The NIST Public Safety Innovation Accelerator Program is seeking applications from U.S. state, local and tribal governments to create a model 'Point Cloud City'. Successful applicants will receive funding to generate an extensive catalog of annotated 3D indoor point clouds that can be used by industry, academia, and government to advance research and development in the areas of indoor mapping, localization and navigation for public safety, as well as to demonstrate the potential value of ubiquitous indoor positioning and location-based information. Recipients will also participate in the NIST Global Cities Team Challenge initiative as the lead for an Action Cluster.
- **Anticipated Amounts:** In FY2018, NIST anticipates up to \$1,000,000 may be available to fund awards in the range of \$50,000 to \$500,000 total with project performance periods of up to one (1) year.
- **Funding Instrument:** Grant or cooperative agreement, as appropriate.

Eligibility: All awards listed in this NOFO are open to U.S. state, local and tribal governments and their official public safety organizations. Institutions of higher education and campus public safety departments are not eligible to apply. However, an eligible organization may propose to work individually or to include proposed sub-awardees, contractors or other collaborators to include institutions of higher education and their public safety departments, non-profit organizations, for-profit organizations, and hospitals. Public-private partnerships are encouraged. Although Federal entities are not eligible to receive funding under this NOFO, they may participate as unfunded collaborators.

NIST will only consider one application per applicant; however, an applicant entity may be proposed as a sub-recipient, contractor, or unfunded collaborator within applications submitted by other entities.

- **Cost Sharing Requirements:** Matching funds are not required, however, voluntary committed cost-share (e.g., in-kind contributions from industry partners) may be included in project budgets and will be considered as part of the selection factors in Section V.2. of this NOFO.
- **Public Website, Frequently Asked Questions (FAQs) and Webinar:** NIST has a public website (pscr.gov) that provides information pertaining to this Funding Opportunity³. NIST anticipates that a “Frequently Asked Questions” section or other resource materials will be maintained and updated on the website as needed to provide additional guidance and clarifying information that may arise related to this Funding Opportunity. Any amendments to this NOFO will be announced through Grants.gov.

Applicants must submit all questions pertaining to this funding opportunity via e-mail to pscr@nist.gov with ‘Point Cloud City’ in the subject line. Questions submitted to NIST may be posted on pscr.gov. Alternatively, applicants may ask questions during the informational public webinar as described in the next paragraph.

NIST hosted a webinar to provide general information regarding this NOFO, offer general guidance on preparing applications, and answer questions. A second webinar to provide general information regarding the amended NOFO will be hosted by NIST. Scheduling details about the webinar will be available at pscr.gov. Proprietary technical discussions about specific project ideas will not be permitted during the webinar and NIST staff will not critique or provide feedback on specific project ideas while they are being developed by an applicant, brought forth during the webinar, or at any time before the deadline for all applications. However, general questions about the PSIAP, eligibility requirements, evaluation and award criteria, selection process, and the general characteristics of a competitive application will be addressed at the webinar and by e-mail to pscr@nist.gov as described in the previous paragraph. There is no cost to attend the webinar, but participants must register in advance. Participation in the webinar is not required, and will not be considered in the application review and selection process. Additional information on the PSIAP and webinar is available at www.nist.gov/ctl/pscr.

³ Refer to Section VII. of this NOFO, Federal Awarding Agency Contacts, Programmatic and Technical Questions, if this link is no longer working or more information is needed.

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FULL ANNOUNCEMENT TEXT

I. Program Description

The statutory authority for the NIST Public Safety Innovation Accelerator Program is 15 U.S.C. § 3706 and 47 U.S.C. § 1443.

The NIST Public Safety Innovation Accelerator Program is seeking applications from U.S. state, local and tribal governments to create a model ‘Point Cloud City’. Successful applicants will receive funding to generate an extensive catalog of annotated 3D indoor point clouds that can be used by industry, academia, and government to advance research and development (R&D) in the areas of indoor mapping, localization and navigation for public safety, as well as to demonstrate the potential value of ubiquitous indoor positioning and location-based information. Recipients will also participate in the NIST Global Cities Team Challenge initiative as the lead for an Action Cluster.

1. Background

The Public Safety Communications Research (PSCR) division, housed within NIST’s Communications Technology Laboratory, conducts research for the first responder community. The PSIAP – Point Cloud City opportunity is one of several current opportunities within the NIST Public Safety Communications Research (PSCR) program. More information about PSCR can be found at pscr.gov. Location-based services (LBS) was identified as one of three key portfolios for R&D investment by first responders, government officials, industry leaders, and academia who participated in the strategic planning effort initiated by PSCR in 2013. LBS can be loosely defined as the provisioning of customized information, features, or services based on a user’s location.

A LBS working group was formed and their inputs, along with industry forecasts, were translated into a long term (20 years) technology roadmap for the benefit of the entire public safety community⁴. As a follow-up, a LBS R&D Summit⁵ was held to further discuss and prioritize the scope of work identified in the technology roadmap. Attendees were instructed to identify the most pressing technology gaps currently limiting the use of LBS in public safety arena, and then to prioritize these challenges based on five investment criteria – leverage, feasibility, impact on public safety processes, rewards/results, and uniqueness to public safety – that were developed in close collaboration with FirstNet and the Public Safety Advisory Committee (PSAC). The summit identified six problem statements around the areas of: indoor 3D geolocation, mapping, interoperability, standardization, power consumption, and wearable devices.

As the LBS portfolio evolved, it became clear through continuous stakeholder engagement, technology landscape assessments, and industry roadmaps that the goals of the LBS portfolio should be further refined to focus exclusively on the indoor ‘problem’ and particular aspects of 1) indoor map creation and classification, 2) indoor localization (i.e. locating and tracking objects in space) and 3) indoor navigation and other location-based information. In addition to funding internal research addressing these areas, in 2017 PSCR awarded \$8.2M for eight grants to address aspects related to the portfolio goals.

2. Opportunity

The ability to locate, track, and inform first responders while indoors under difficult conditions remains a ‘Holy Grail’ sought by public safety. Law enforcement officers enter buildings every day, often alone and in peril, without the benefits of indoor tracking. Firefighters continue to die or become seriously injured each year because they are lost, disoriented, or difficult to locate in emergency situations.

The intricately related fields of indoor mapping, localization, and navigation are all experiencing rapid growth as technology companies, network operators, and the manufacturing, service, and retail industries seek to understand where people and inventory are at any moment to deliver optimized location-based services, entertainment, or asset-tracking. Despite this growth, a solution that meets the challenging requirements of first responders has yet to emerge.

Accurate, readily available, information-rich indoor maps and models are one of the keys to unlocking indoor localization, tracking, and navigation for first responders – both from an operational standpoint and to enable the R&D community to address specific public safety requirements in this field. First responders typically survey high-risk facilities in their jurisdiction as part of a preplanning process, generating reports and/or

⁴ Location-Based Services R&D Roadmap; NIST Technical Note 1883;
<http://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.1883.pdf>

⁵ 2015 Location-Based Services R&D Summit;
<http://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.1914.pdf>

annotating their own maps in the process. The process is extremely time-consuming and must be repeated every so often to identify changes to a facility.

Though there are several approaches for creating indoor building maps and data, the PSIAP is specifically interested in the use of 3D modern light detection and ranging (LiDAR) technology to generate point clouds. Though not widely used currently for surveying, especially outside the architectural, engineering, and construction (AEC) community, 3D LiDAR enables users to accurately capture the details of an indoor space in a relatively short manner and in a computationally-friendly format. Further, it is expected that investments and adoption in 3D LiDAR, particularly by the automotive and unmanned aircraft systems industries, will drive the cost down dramatically over the next 5 to 10 years so that the use of such technology will be practical for public safety organizations, building owners/managers, and various service industries.

Thus, the NIST Public Safety Innovation Accelerator Program (PSIAP) is soliciting applications from state, local and tribal government entities to develop a catalog of annotated indoor point cloud models captured using 3D LiDAR that can be used to advance and demonstrate research and development focused on public safety indoor mapping, localization, and navigation.

Awardees will survey a significant number of diverse buildings and structures throughout their city, county or region to generate a catalog of available indoor 3D point cloud models and data that can be leveraged by the R&D and public safety communities to accelerate indoor mapping, localization, and navigation technologies for first responders. Applicants must demonstrate a sincere interest in actively collaborating with both public safety organizations and the R&D community to advance these technologies through the sharing of data and facilitating test and evaluation activities in the buildings for which data is created.

A desired output of the research funded under this NOFO is a datastore or datastores of 3D point clouds and simultaneous 360° imagery annotated with public safety relevant objects⁶, building information, and any other data that may be collected and annotated to enable additional R&D related to indoor localization and navigation, as well as other novel indoor location-based services. Once created, the datastore(s) will be used to accelerate R&D related to areas including, but not limited to:

- automated point cloud to building model (3D and 2D) conversion and scene identification (e.g. office, mechanical room, lab, etc.);
- machine learning algorithms for classification of public safety relevant objects (e.g. standing water pipe, power panel, hazards, etc.);
- integration with augmented and virtual reality technologies for first responder operations, testing, and training; and

⁶ See the National Alliance for Public Safety GIS [symbol library](#) for a catalog of public safety relevant objects.

- use of LiDAR in operational localization systems and as high-precision reference system for test and measurement of operational systems.

Another desired research output is that the surveyed buildings, or at least a representative subset, will be available to both public safety users and the R&D community for real-world testing of indoor localization and navigation systems. Applicants are encouraged to consult with public safety organizations and the R&D community to help ensure that the selected buildings and data collection are highly relevant and will have a meaningful impact to first responders. Applicants must obtain required permissions to utilize all buildings proposed in this project and permissions that ensure such buildings will be available in the future for the public safety and R&D communities to conduct test and evaluation activities.

The PSIAP recognizes that there are many approaches, both in terms of the specific products used and partnerships formed, that could meet the objectives of this NOFO. For example, an applicant could procure 3D LiDAR equipment and conduct the surveying, data collection and processing using its own or contracted staff. An applicant could, alternatively, partner with a company that manufactures or uses 3D LiDAR equipment, which would provide in-kind services in exchange for access to a wealth of buildings and the opportunity to expose other government entities to their products and business model. Applicants are encouraged to consider a range of approaches and select the one that best meets the objectives described in this NOFO.

In addition to the 3D point clouds, applicants must also capture simultaneous timestamped images from a 360° panoramic camera so that: 1) the point clouds and images may be integrated to present realistic color, and 2) to enable future users of the dataset to perform their own feature extraction and object classification using either the raw imagery or point cloud data.

All LiDAR data must be fully compliant with the American Society for Photogrammetry and Remote Sensing [LAS specification](#), version 1.4, using point data record format 6 – 10. Applicants must also specify the accuracy and point spacing (resolution) of the data. In addition, point clouds must be georeferenced to an outside point or points (preferably the main entrances/exits) in a known, defined coordinate reference system (CRS; e.g. WGS 1984, UTM, etc.) – as opposed to referencing where the surveying started (at point 0, 0, 0). Therefore, applicants must specify the CRS and approach that will be used to georeference the point clouds.

Applicants must consider both the information security of the data generated in the project and the safety of building occupants when operating the LiDAR equipment. Applicants must also address how the data will be stored, managed, and distributed, as well as how feasible it will be for others to make future contributions to the data set, e.g. adding additional buildings or annotations. Further, to assist PSIAP with generating metrics to understand and demonstrate the value of the outputs created from PSIAP-PC2 to the R&D and public safety communities, applicants must describe any use of

licensing (e.g., Creative Commons, Open Data Commons, etc.), citations and persistent identifiers, page views, downloads, or other means of measuring research impacts. In addition, applicants must address laser safety issues associated with the chosen LiDAR equipment and how they plan to notify building stakeholders and occupants about safety and privacy aspects of the survey and data collection process.

The PSIAP recognizes that operational demands and limited budgets typically preclude public safety entities from dedicating resources to participate in R&D activities. Therefore, if necessary, applicants may include funding in their proposed budget for non-federal first responders and public safety personnel to actively participate within their project. Please note that Federal entities are not eligible to receive funding under this NOFO, though they may participate as unfunded collaborators.

Awardees will be expected to demonstrate their approach and share the results of this program with other interested municipalities. To facilitate this engagement, recipients will be required to participate in the [Global City Teams Challenge](#) (GCTC). The GCTC program is a collaborative platform for the development of smart cities and communities. It enables local governments, nonprofit organizations, academic institutions, technologists, and private corporations from all over the world to form project teams, or “action clusters,” and “SuperClusters,” to work on groundbreaking technologies and applications within the smart city and community environment. Recipients will be required to apply for and lead an ‘action cluster’ in the GCTC related to their project, including attending the GCTC Expo 2018 to demonstrate their project and results to date. If multiple awards are made, the team leads will consist of individuals drawn from each award team. Applicants should consult the GCTC website for more information about the participation requirements. In addition, recipients will be required to attend the PSCR Public Safety Broadband Stakeholder Meetings each June during the term of the award to meet with stakeholders and present key plans and findings of their work to date.

Applicants may plan to disseminate the results of their project to public safety and relevant R&D communities through other activities, including conference presentations, publications, training, and/or data sets. Applicants may include funding in their proposed budget that would support the dissemination of the results and lessons of their PSIAP – Point Cloud City efforts to the public safety stakeholder community.

II. Federal Award Information

1. Funding Instrument

The funding instrument used in this program will be grants or cooperative agreements, as appropriate. Where cooperative agreements are used, the nature of NIST’s “substantial involvement” will generally include collaboration with the recipients in the scope of work.

2. Funding Availability

In FY2018, NIST anticipates up to \$1,000,000 may be available to fund awards in the range of \$50,000 to \$500,000 total with project performance periods of up to one (1) year.

III. Eligibility Information

1. Eligible Applicants

All awards listed in this NOFO are open to U.S. state, local and tribal governments and their official public safety organizations. Institutions of higher education and campus public safety departments are not eligible to apply. However, an eligible organization may propose to work individually or to include proposed sub-awardees, contractors or other collaborators to include institutions of higher education and their public safety departments, non-profit organizations, for-profit organizations, and hospitals. Public-private partnerships are encouraged. Although Federal entities are not eligible to receive funding under this NOFO, they may participate as unfunded collaborators.

NIST will only consider one application per applicant; however, an applicant entity may be proposed as a subrecipient, contractor, or unfunded collaborator within applications submitted by other entities.

2. Cost Sharing or Matching

Matching funds are not required, however, voluntary committed cost-share (e.g., in-kind contributions from industry partners) may be included in project budgets and will be considered as part of the selection factors in Section V.2. of this NOFO.

IV. Application and Submission Information

1. Address to Request Application Package

The application package is available at www.grants.gov under Funding Opportunity Number 2018-NIST-PSIAP-PC2.

2. Content and Form of Application Submission

a. Required Forms and Documents. The Application must contain the following:

(1) SF-424, Application for Federal Assistance. The SF-424 must be signed by an authorized representative of the applicant organization.

- SF-424, Item 8.d Zip/Postal Code field should reflect the zip code + 4 (##### - ####) format.
- Item 12, should list the NOFO number 2018-NIST-PSIAP-PC2.
- SF-424, Item 18, field a., should list the total Federal budget amount requested for the entire project.

- If the applicant includes voluntary committed cost share, SF-424, Item 18, field b., should list the applicant's anticipated voluntary committed cost share for the entire project.
- For SF-424, Item 21, the list of certifications and assurances is contained in the SF-424B.

(2) SF-424A, Budget Information - Non-Construction Programs. The budget should reflect anticipated expenses for the project, considering all potential cost increases, including cost of living adjustments.

The Grant Program Function or Activity on Section A, Line 1, Column (a) should be entered as "Public Safety Communications Research Grant Program". The Catalog of Federal Domestic Assistance Number on Line 1, Column (b) should be entered as "11.609". Line 1, Column (e) should reflect the anticipated federal expenses for the full term of the project. If the applicant intends to include voluntary committed cost share, that voluntary committed cost share for the full term of the project should be reflected on Section A, Line 1, Column (f).

Section B, column (1) of the SF-424A should reflect funds for the full performance period of the award.

Section C, line 8., column (b) of the SF-424A should reflect the applicant's anticipated voluntary committed cost share for the full term of the project.

(3) SF-424B, Assurances - Non-Construction Programs

(4) CD-511, Certification Regarding Lobbying. Enter "2018-NIST-PSIAP-PC2" in the Award Number field. Enter the title of the application used in field 15 of the SF-424, or an abbreviation of that title, in the Project Name field.

(5) SF-LLL, Disclosure of Lobbying Activities (if applicable)

(6) Executive Summary. This section should summarize key aspects of the technical approach and qualifications of the team. This section must not include any proprietary or sensitive business information as NIST may make the executive summary available to the public after selection of awards. The executive summary must not exceed one (1) single-sided page. Any executive summary material provided beyond this one-page limit will be redacted and not provided to the reviewers.

(7) Technical Proposal. The Technical Proposal is a document of no more than twenty (20) pages total, which is responsive to the program description (see Section I. of this NOFO) and the evaluation criteria (see Section V.1. of this NOFO). The Technical Proposal must contain the following information:

- (a) Project Description.** This is a detailed description of the proposed project and should include information regarding:
- (i) The total square footage and diversity of previously non-surveyed buildings and structures that will be surveyed as part of this project, including a map identifying all the buildings and structures that will be surveyed and made available.
 - (ii) The types of data that will be collected in addition to, or conjunction with, the point cloud models.
 - (iii) How the data will be collected, specifying the 3D LiDAR product that will be used and including how the applicant will address laser safety issues and notification of building stakeholders and occupants about the survey and data collection process.
 - (iv) The file format, accuracy, and point spacing (resolution) of the data, as well as the approach to georeferencing the point clouds.
 - (v) How the data will be annotated, processed, organized, stored, and made available; the longevity of the datastore(s) and how the datastore(s) will be supported; any restrictions that will be placed on access; and, if applicable, how information security concerns will be addressed.
 - (vi) How the surveyed facilities will be made available in the future for both the public safety and the R&D communities to leverage for test and evaluation purposes.

This section will be evaluated in accordance with the *Technical Merit* and *Availability* evaluation criteria: (see Sections V.1.a. and V.1.b. of this NOFO). **The Project Description section must not exceed ten (10) single-sided pages.** Any material provided beyond this page limit will be redacted and not provided to the reviewers.

- (b) Project Execution.** This section should provide clear and quantifiable goals, milestones, timelines, and key performance indicators that support the objectives in the Technical Proposal. In addition, this section should describe the cost effectiveness and value, including the use of any in-kind or cost-share with respect to executing the proposed project and meeting the stated objectives.

This section will be evaluated in accordance with the *Project Execution* evaluation criterion (see Section V.1.c. of this NOFO). **The Project Execution section must not exceed five (5) single-sided pages.** Any material provided beyond this page limit will be redacted and not provided to the reviewers.

- (c) Qualifications.** This section should provide a detailed description of the qualifications of key personnel, both technical and programmatic, who will be assigned to work on the proposed project. Examples of demonstrated

success on projects similar in scope and magnitude to the proposed project should be included in this section, if applicable. In addition, the applicant's plans to sustain and manage work related to or in support of the proposed project once the project is complete should be included.

This section will be evaluated in accordance with the *Qualifications* evaluation criterion (see Section V.1.d. of this NOFO). **The Qualifications and Resource Availability section must not exceed five (5) single-sided pages.** Any material provided beyond this page limit will be redacted and not provided to the reviewers.

- (8) Resume(s).** Resumes are required for all key personnel, including the principal investigator. Awardees are advised that any changes to individuals deemed 'key personnel', including disengagement from the project for more than three months or a 25% reduction of effort, will require prior approval, in writing, by the NIST Grants Officer.

This section will be evaluated in accordance with the *Qualifications* evaluation criterion (see Section V.1.d. of this NOFO). There are no page limits for resumes. However, any material considered inappropriate for inclusion in a resume (e.g. supplementary text for another section) will be redacted and not provided to the reviewers.

Resumes do not count against the twenty (20) page limit of the Technical Proposal.

- (9) Budget Narrative.** (This does not count toward the page limit). The Budget Narrative must provide a detailed breakdown of each of the object class categories as reflected on the SF-424A. The budget justification should address all the budget categories (personnel, fringe benefits, equipment, travel, supplies, other direct costs and indirect costs) for which Federal funds are requested. The written justification should include the necessity and the basis for the cost. Proposed funding levels must be consistent with the project scope, and only allowable costs should be included in the budget. Information on cost allowability is available in the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards at 2 C.F.R. Part 200 (<http://go.usa.gov/SBYh>), which apply to awards in this program. Voluntary committed cost share must be included in the appropriate categories. Information needed for each category is as follows:

- (a) Personnel.** At a minimum, the budget justification for all personnel should include the following: name, job title, commitment of effort on the proposed project in terms of average number of hours per week or percentage of time, salary rate, total direct charges on the proposed project, description of the role of the individual on the proposed project and the work to be performed.

(b) Fringe Benefits. Fringe benefits should be identified separately from salaries and wages and based on rates determined by organizational policy. The items included in the fringe benefit rate (e.g. health insurance, parking, etc.) should not be charged under another cost category.

(c) Travel. For travel costs required by the recipient to complete the project, including attendance at any relevant conferences, the budget justification for travel should include the following: destination; names and number of people traveling; dates and/or duration; mode of transportation, lodging and subsistence rates; and description of how the travel is directly related to the proposed project. For travel that is yet to be determined, please provide best estimates based on prior experience. If a destination is not known, an approximate amount may be used with the assumptions given for the location of the meeting.

As described in the Program Description (see Section I. of this NOFO), recipients will be required to attend the PSCR Public Safety Broadband Stakeholder Meetings (PSBSM) and the GCTC Expo to meet with stakeholders and present key plans and findings of their work to date. Recipients must send a minimum of one team member to each event during the term of the grant. The PSCR PSBSMs are held each June in the continental United States and are typically four days in length. In 2018, the PSBSM will be held June 5-8 in San Diego, CA. The dates and location of the 2019 PSBSM have not been determined at this time. The GCTC Expo is typically two days in length and is held in the Washington D.C. area. Applicants should factor in the cost for attending these events in their budget narrative and SF424A form.

(d) Equipment. Equipment is defined as an item of property that has an acquisition cost of \$5,000 or more (unless the organization has established lower levels) and an expected service life of more than one year. Any items that do not meet the threshold for equipment can be included under the supplies line item. The budget justification should list each piece of equipment, the cost, and a description of how it will be used and why it is necessary to the successful completion of the proposed project. Please note that any general use equipment (computers, etc.) charged directly to the award should be allocated to the award according to expected usage on the project.

(e) Supplies. Supplies are defined as all tangible personal property other than those described in equipment (see Section IV.2.a.(9)(d) of this NOFO). Provide a list of each supply necessary for the project, and the breakdown of the total costs by quantity or unit of cost. Include the necessity of the cost for the completion of the proposed project.

(f) Contracts/Subawards. Each contract or subaward should be treated as a separate item. Describe the services to be provided and the necessity of the subaward or contract to the successful performance of the proposed project. Contracts are for obtaining goods and services. Subawardees perform part of the project scope of work. For each subaward, applicants must provide budget detail justifying the cost of the work performed on the project.

(g) Construction. Applications to PSIAP-PC2 may not include construction costs as part of their budget.

(h) Other Direct Costs. For costs that do not easily fit into the other cost categories, e.g., publishing fees or software distribution expenses, please list the cost and the breakdown of the total costs by quantity or unit of cost. Include the necessity of the cost for the completion of the proposed project. Only allowable costs can be charged to the award.

This section will be evaluated in accordance with the *Project Execution* evaluation criteria (see Section V.1.c. of this NOFO). It will also be reviewed to determine if all costs are reasonable, allocable, and allowable under 2 C.F.R. Part 200 Subpart E, Cost Principles.

(10) Indirect Cost Rate Agreement If indirect costs are included in the proposed budget, provide a copy of the approved negotiated agreement if this rate was negotiated with a cognizant Federal audit agency. If the rate was not established by a cognizant Federal audit agency, provide a statement to this effect. If the successful applicant includes indirect costs in the budget and has not established an indirect cost rate with a cognizant Federal audit agency, the applicant will be required to obtain such a rate in accordance with the Department of Commerce Financial Assistance Standard Terms and Conditions (<http://go.usa.gov/xXRxK>).

Alternatively, in accordance with 2 C.F.R. § 200.414(f), applicants that have never received a negotiated indirect cost rate may elect to charge indirect costs to an award pursuant to a de minimis rate of 10 percent of modified total direct costs (MTDC), in which case a negotiated indirect cost rate agreement is not required. Applicants proposing a 10 percent de minimis rate pursuant to 2 C.F.R. § 200.414(f) should note this election as part of the budget and budget narrative portion of the application.

(11) Letters of Commitment. Letters of Commitment must be submitted by all funded and unfunded entities that will have an active role in executing the activities outlined in the Technical Proposal. Letters of Commitment must address the level of participation, qualifications of the personnel who will be actively involved, and how successful completion of this project would positively impact their profession or community. Letters of Commitment must also specify

any voluntary committed cost-share, including the specific services and/or products to be used in the project. Letters of Commitment must be signed by an individual with sufficient authority to legally bind the organization to its commitment. Letters of Commitment are required from the entities that own or have the legal authority to authorize access to the buildings to be surveyed and for their future use as testing/evaluation sites.

Letters of Commitment will be evaluated in accordance with the *Qualifications* evaluation criteria (see Section V.1.d.) of this NOFO).

Letters of commitment do not count against the twenty (20) page limit of the Technical Proposal.

(12) Letters of Support. Letters of Support are not required but may be provided by any entity that has a shared interest in the proposal's success from a technological standpoint. Letters of Support may not be provided by an entity proposed to be actively involved in the performance of the Technical Proposal.

Letters of Support do not count against the twenty (20) page limit of the Technical Proposal.

(13) Data Management Plan. Consistent with NIST Policy 5700.00⁷, *Managing Public Access to Results of Federally Funded Research*, and NIST Order 5701.00⁸, *Managing Public Access to Results of Federally Funded Research*, applicants must include a Data Management Plan (DMP).

The DMP is a supplementary document of not more than two pages that must include, at a minimum, a summary of proposed activities that are expected to generate data, a summary of the types of data expected to be generated by the identified activities, a plan for storage and maintenance of the data expected to be generated by the identified activities, and a plan describing whether and how data generated by the identified activities will be reviewed and made available to the public. As long as the DMP meets these NIST requirements, it may take the form specified by the applicant's institution or some other entity (e.g., the National Science Foundation⁹ or the National Institutes of Health¹⁰).

All applications for activities that will generate scientific data using NIST funding are required to adhere to a DMP or explain why data sharing and preservation are not within the scope of the project.

⁷<http://www.nist.gov/data/upload/Final-P-5700.pdf>

⁸http://www.nist.gov/data/upload/Final-O-5701_0.pdf

⁹<http://www.nsf.gov/bfa/dias/policy/dmp.jsp>

¹⁰http://grants.nih.gov/grants/policy/data_sharing/data_sharing_guidance.htm

For the purposes of the DMP, NIST adopted the definition of “research data” at 2 C.F.R. § 200.315(e)(3) (available at <http://go.usa.gov/3sZvQ>).

Reasonable costs for data preservation and access may be included in the application.

The sufficiency of the DMP will be considered as part of the administrative review (see Section V.3.a. of this NOFO); however, the DMP will not be evaluated against any evaluation criteria.

b. Attachment of Required Documents

Items IV.2.a.(1) through IV.2.a.(5) above are part of the standard application package in Grants.gov and can be completed through the download application process.

Items IV.2.a.(6) through IV.2.a.(13) must be completed and attached by clicking on “Add Attachments” found in item 15 of the SF-424, Application for Federal Assistance. This will create a zip file that allows for transmittal of the documents electronically via Grants.gov.

Applicants should carefully follow specific Grants.gov instructions at www.grants.gov to ensure the attachments will be accepted by the Grants.gov system. A receipt from Grants.gov indicates only that an application was transferred to a system. It does not provide details concerning whether all attachments (or how many attachments) transferred successfully. Applicants using Grants.gov will receive a series of e-mail messages over a period of up to two business days before learning whether a Federal agency’s electronic system has received its application.

Applicants are strongly advised to use Grants.gov’s “Download Submitted Forms and Applications” option to check that their application’s required attachments were contained in their submission.

After submitting the application, follow the directions found at this link, https://www.grants.gov/help/html/help/Applicants/CheckApplicationStatus/Download_Submitted_Forms_and_Applications.htm in the Grants.gov Online Users Guide.

If any, or all, of the required attachments are absent from the submission, follow the attachment directions found above, resubmit the application, and check again for the presence of the required attachments.

If the directions found at https://www.grants.gov/help/html/help/Applicants/CheckApplicationStatus/Download_Submitted_Forms_and_Applications.htm are not effective, please contact the Grants.gov Help Desk immediately. If calling from within the United States or from a U.S. territory, please call 800-518-4726. If calling from a place outside the United States or a U.S. territory, please call 606-545-5035. E-mails should be addressed to support@grants.gov. Assistance from the Grants.gov Help Desk will be available

around the clock every day, with the exception of Federal holidays. Help Desk service will resume at 7:00 a.m. Eastern Time the day after Federal holidays.

Applicants can track their submission in the Grants.gov system by following the procedures at the Grants.gov site (<http://go.usa.gov/cjamz>). It can take up to two business days for an application to fully move through the Grants.gov system to NIST.

NIST uses the Tracking Numbers assigned by Grants.gov, and does not issue Agency Tracking Numbers.

c. Application Format

- (1) Paper, E-mail and Facsimile (fax) Submissions.** Will not be accepted.
- (2) Figures, Graphs, Images, and Pictures.** Should be of a size that is easily readable or viewable and may be landscape orientation.
- (3) Font.** Easy to read font (12-point minimum). Smaller type may be used in figures and tables but must be clearly legible.
- (4) Page Limit.** Twenty (20) pages for the Technical Proposal, noting the following limits for each section of the Technical Proposal (see Section IV.2.a.(7) of this NOFO): Project Description ten (10) pages; Project Execution five (5) pages; Qualifications and Resources Availability five (5) pages excluding resumes.
- (5) Page Limit Excludes:** SF-424, Application for Federal Assistance; SF-424A, Budget Information – Non-Construction Programs; SF-424B, Assurances – Non-Construction Programs; CD-511, Certification Regarding Lobbying; SF-LLL, Disclosure of Lobbying Activities; Resumes of key personnel (although resumes are limited to two (2) pages each); Budget Narrative; Indirect Cost Rate Agreement, Letters of Commitment; Letters of Support; and the Data Management Plan.
- (6) Page size.** 21.6 centimeters by 27.9 centimeters (8 ½ inches by 11 inches).
- (7) Application language.** English.

d. Application Replacement Pages. Applicants may not submit replacement pages and/or missing documents once an application has been submitted. Revisions can only be made by submitting a complete new application that is received by NIST before the submission deadline.

e. Pre-Applications. Pre-applications are not required under this NOFO.

- f. **Statement of Intent.** To assist NIST in gauging interest and planning for the evaluation process all potential applicants are strongly encouraged to send an e-mail to pscr@nist.gov with 'Point Cloud City' in the subject line indicating intent to apply. The statement of intent will only be used for competition planning purposes; it will not be used as part of the evaluation process or to eliminate any applicants from consideration under this NOFO. An applicant will receive full consideration under this NOFO if they do not submit a statement of intent.
- g. **Certifications Regarding Federal Felony and Federal Criminal Tax Convictions, Unpaid Federal Tax Assessments and Delinquent Federal Tax Returns.** In accordance with Federal appropriations law, an authorized representative of the selected applicant(s) may be required to provide certain pre-award certifications regarding Federal felony and Federal criminal tax convictions, unpaid Federal tax assessments, and delinquent Federal tax returns.

3. Unique Entity Identifier and System for Award Management (SAM)

Pursuant to 2 C.F.R. part 25, applicants and recipients (as the case may be) are required to: (i) be registered in SAM before submitting its application; (ii) provide a valid unique entity identifier in its application; and (iii) continue to maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency, unless otherwise excepted from these requirements pursuant to 2 C.F.R. § 25.110. NIST will not make a Federal award to an applicant until the applicant has complied with all applicable unique entity identifier and SAM requirements and, if an applicant has not fully complied with the requirements by the time that NIST is ready to make a Federal award pursuant to this NOFO, NIST may determine that the applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another applicant.

4. Submission Dates and Times

Electronic applications must be received at Grants.gov no later than 11:59 p.m. Eastern Time, Friday, April 20, 2018. NIST will consider the date and time recorded by Grants.gov as the official submission time. Applications received after this deadline will not be reviewed or considered. Paper applications will not be accepted.

Applicants should be aware, and factor in their application submission planning, that the Grants.gov system is expected to be closed for routine maintenance from 12:01 a.m. Eastern Time, Saturday, March 17, 2018 until 6:00 a.m. Eastern Time, Monday, March 19, 2018.

Applications cannot be submitted when Grants.gov is closed. NIST expects to complete its review, selection of successful applicants, and award processing by June 2018. NIST expects the earliest start date for awards under this NOFO to be August 1, 2018.

When developing the submission timeline, please keep in mind that: (1) all applicants are required to have a current registration in the electronic System for Award Management (SAM.gov); (2) the free annual registration process in the SAM.gov (see Sections IV.3. and IV.7.a.(1).(b). of this NOFO) often takes between three and five business days and may take as long as two weeks; (3) applicants are required to have a current registration in Grants.gov; and (4) applicants using Grants.gov will receive e-mail notifications over a period of up to two business days as the application moves through intermediate systems before the applicant learns via a validation or rejection notification whether NIST has received the application. (See <http://www.grants.gov> for full information on application and notification through Grants.gov.). Please note that a Federal assistance award cannot be issued if the designated recipient's registration in the System for Award Management (SAM.gov) is not current at the time of the award.

5. Intergovernmental Review

Applications under this Program are not subject to Executive Order 12372.

6. Funding Restrictions

Applications for product development and/or commercialization are not considered responsive to this NOFO. Profit or fee is not an allowable cost.

7. Other Submission Requirements

a. Applications must be submitted electronically.

(1) Applications must be submitted via Grants.gov at www.grants.gov.

- (a) Applicants should carefully follow specific Grants.gov instructions to ensure that all attachments will be accepted by the Grants.gov system. A receipt from Grants.gov indicating an application is received does not provide information about whether attachments have been received. For further information or questions regarding applying electronically for the 2018-NIST-PSIAP-PC2 announcement, contact Christopher Hunton by phone at 301-975-5718 or by e-mail at grants@nist.gov.
- (b) Applicants are strongly encouraged to start early and not wait until the approaching due date before logging on and reviewing the instructions for submitting an application through Grants.gov. The Grants.gov registration process must be completed before a new registrant can apply electronically. If all goes well, the registration process takes three to five business days. If problems are encountered, the registration process can take up to two weeks or more. Applicants must have a valid unique entity identifier number and must maintain a current registration in the Federal government's primary registrant database, the System for Award Management (<https://www.sam.gov/>), as explained on the Grants.gov Web site (also see Section IV.4. of this NOFO). After registering, it may take several days or

longer from the initial log-on before a new Grants.gov system user can submit an application. Only individuals authorized as organization representatives will be able to submit the application, and the system may need time to process a submitted application. Applicants should save and print the proof of submission they receive from Grants.gov. If problems occur while using Grants.gov, the applicant is advised to (a) print any error message received and (b) call Grants.gov directly for immediate assistance. If calling from within the United States or from a U.S. territory, please call 800-518-4726. If calling from a place other than the United States or a U.S. territory, please call 606-545-5035. Assistance from the Grants.gov Help Desk will be available around the clock every day, except for Federal holidays. Help Desk service will resume at 7:00 a.m. Eastern Time the day after Federal holidays. For assistance using Grants.gov, the applicant may also contact support@grants.gov.

- (c) To find instructions for submitting an application on Grants.gov, Applicants should refer to the “Applicants” tab in the banner just below the top of the www.grants.gov home page. Clicking on the “Applicants” tab produces two exceptionally useful sources of information, Applicant Actions and Applicant Resources, which applicants are advised to review.

Applicants will receive a series of e-mail messages over a period of up to two business days before learning whether a Federal agency’s electronic system has received its application. Closely following the detailed information in these subcategories will increase the likelihood of acceptance of the application by the Federal agency’s electronic system.

Applicants should pay close attention to the guidance under “Applicant FAQs,” as it contains information important to successful submission on Grants.gov, including essential details on the naming conventions for attachments to Grants.gov applications.

All applicants should be aware that adequate time must be factored into applicants’ schedules for delivery of their application. Applicants are advised that volume on Grants.gov may be extremely heavy leading up to the deadline date.

The application must be both received and validated by Grants.gov. The application is “received” when Grants.gov provides the applicant a confirmation of receipt and an application tracking number. If an applicant does not see this confirmation and tracking number, the application has not been received. After the application has been received, it must still be validated. During this process, it may be “validated” or “rejected with errors”. To know whether the application was rejected with errors and the reasons why, the applicant must log in to Grants.gov, select “Applicants” from the top navigation, and select “Track my application” from the drop-down list. If the status is “rejected with errors,” the applicant may still seek to correct the errors and

resubmit the application before the deadline. If the applicant does not correct the errors, the application will not be forwarded to NIST by Grants.gov.

Refer to important information in Section IV.4. Submission Dates and Times, to help ensure the application is received on time.

- b. **Amendments.** Any amendments to this NOFO will be announced through Grants.gov. Applicants may sign up on Grants.gov to receive amendments by e-mail or may request copies by e-mail from pscr@nist.gov.

V. Application Review Information

Proposals, reports, documents and other information related to applications submitted to NIST and/or relating to financial assistance awards issued by NIST will be reviewed and considered by Federal employees, Federal agents and contractors, and/or by non-Federal personnel who have entered into conflict of interest and confidentiality agreements covering such information, when applicable.

1. Evaluation Criteria

Applications will be evaluated per the following evaluation criteria. Total scores will be calculated out of a maximum of 100 points according to the individual points and weights associated with each criterion in the table below.

Evaluation Criteria	Maximum Points	Weight	Total
Technical	10	4	40
Availability	10	4	40
Project Execution	10	1	10
Qualifications	10	1	10
		Total score:	100

For example, an application receiving criterion scores of 8, 7, 10, and 9, (respectively) would receive a total score of 79 according to the following calculation: $(8 \times 4) + (7 \times 4) + (10 \times 1) + (9 \times 1) = 79$.

- a. **Technical merit:** Reviewers will evaluate:
 - (1) The extent to which the proposal demonstrates a clear understanding of the program goals.
 - (2) The extent to which the technical approach is comprehensive, innovative, feasible, and likely to achieve the NOFO's stated objectives.

- (3) The number of buildings and the amount, diversity, and quality of the 3D point cloud and imagery data that will be collected and annotated, and the potential impact for accelerating R&D related to indoor mapping, localization, and navigation.

b. Availability: Reviewers will evaluate:

- (1) The extent to which the outputs will be available, traceable, and extendable for the public safety and R&D communities in usable format(s) and datastore(s).
- (2) The extent to which information security concerns about data collection, storage, and distribution have been addressed, if applicable.
- (3) The extent to which the surveyed buildings will be available to the public safety and R&D communities for future test and evaluation activities.

c. Project Execution: Reviewers will evaluate:

- (1) The feasibility and appropriateness of the goals, milestones, timelines, and key performance indicators.
- (2) The appropriateness and cost effectiveness of the budget with respect to executing the proposed project.
- (3) The degree to which the budget reflects a clear understanding of the objectives of the NOFO.
- (4) The extent to which safety and privacy aspects of the survey and data collection process have been considered.

d. Qualifications: Reviewers will evaluate:

- (1) The relevance and the appropriateness of the qualifications and experience of the key personnel and technical experts participating in the project, and the likelihood that they will be able to fulfill the objectives of this NOFO, including participation in the GCTC program.
- (2) Letters of Commitment for the appropriateness of the partnership, the relevance of their expertise, and their ability to contribute effectively to the project.

2. Selection Factors

The Selecting Official, the Chief of the PSCR Division, shall generally select and recommend the most meritorious applications for an award based upon the final adjectival ratings prepared by the Evaluation Panel and one or more of the eight (8) selection factors listed below. The Selecting Official also retains the discretion to select and recommend an application out of order (i.e. from a lower adjectival category) based on one or more of the following selection factors:

- a. Results of the merit reviewers' evaluations.
- b. Adjectival ratings.
- c. The availability of funding.
- d. The extent to which matching funds and/or in-kind contributions (voluntary committed cost share) would help ensure potential success of the project.

- e. Whether the project duplicates other projects funded by NIST or other Federal agencies.
- f. Alignment with NOFO objectives and PSCR priorities.
- g. Diversity within the PSCR R&D portfolio.
- h. Regional diversity.

3. Review and Selection Process

Proposals, reports, documents and other information related to applications submitted to NIST and/or relating to financial assistance awards issued by NIST will be reviewed and considered by Federal employees, or non-Federal personnel who have entered into conflict of interest and confidentiality agreements covering such information, when applicable.

a. Initial Administrative Review of Applications. Applications received by the deadline will be reviewed to determine eligibility, completeness, and responsiveness to this NOFO and to the scope of the stated program objectives (see Section I. of this NOFO). Applications determined to be ineligible, incomplete, and/or nonresponsive may be eliminated from further review. However, NIST, in its sole discretion, may continue the review process for an application that is missing non-substantive information, the absence of which may easily be rectified during the review process.

b. Full Review of Eligible, Complete, and Responsive Applications. Applications that are determined to be eligible, complete, and responsive will proceed for full reviews in accordance with the review and selection process below:

(1) Merit Review. At least three (3) objective reviewers, who may be Federal employees or non-Federal personnel, with appropriate professional and technical expertise relating to the topics covered in this NOFO, will evaluate and score each eligible, complete, and responsive application based on the evaluation criteria (see Section V.1. of this NOFO). While every application will have at least three reviews, applications may have more than three (3) reviewers if specialized expertise is needed to evaluate an application. During the review process, the reviewers may discuss the applications with each other, but scores will be determined on an individual basis. Reviewers may consult as a panel with Federal or non-Federal subject-matter experts to seek clarification or explanation of specific issues identified during the initial review process. Applications will be ranked by averaging the scores of all reviewers for each application.

(2) Evaluation Panel. Following the merit review, an evaluation panel consisting of NIST staff and/or other Federal employees with the appropriate technical expertise will conduct a panel review of the ranked applications. The evaluation panel may contact applicants via e-mail or teleconference to clarify contents of an application. The evaluation panel will provide a final adjectival rating and

written evaluation of the applications to the Selecting Official (see Section V.2. of this NOFO) for further deliberation, considering:

- (a) All application materials.
- (b) Results of the merit reviewers' evaluations, including scores and written assessments.
- (c) Any relevant publicly available information.
- (d) Any clarifying information obtained through e-mail or teleconferences with the applicants.

The adjectival ratings are:

Fundable, Outstanding
Fundable, Very Good
Fundable
Unfundable

For decision-making purposes, applications receiving the same adjectival rating will be considered to have an equivalent ranking, although their review scores may not necessarily be the same.

- (3) Selection.** The Selecting Official, Chief of the PSCR Division, will make final award recommendations to the NIST Grants Officer. The Selecting Official shall generally select and recommend the most meritorious applications for an award based on the final adjectival ratings prepared by the Evaluation Panel and one or more of the eight (8) selection factors described in Section V.2. of this NOFO. The Selecting Official retains the discretion to select and recommend an application out of order (i.e., from a lower adjectival category) based on one or more of the selection factors.

NIST reserves the right to negotiate the budget costs with any applicant selected to receive an award, which may include requesting that the applicant removes certain costs. Additionally, NIST may request that successful applicants modify objectives or work plans and provide supplemental information required by the agency prior to award. NIST also reserves the right to reject an application where information is uncovered that raises a reasonable doubt as to the responsibility of the applicant. NIST may select some, all, or none of the applications, or part(s) of any application. The final approval of selected applications and issuance of awards will be by the NIST Grants Officer. The award decisions of the NIST Grants Officer are final.

- c. Federal Awarding Agency Review of Risk Posed by Applicants.** After applications are proposed for funding by the Selecting Official, the NIST Grants Management Division (GMD) performs pre-award risk assessments in accordance with 2 C.F.R. § 200.205, which may include a review of the financial stability of an

applicant, the quality of the applicant's management systems, the history of performance, and/or the applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities.

In addition, prior to making an award where the total Federal share is expected to exceed the simplified acquisition threshold (currently \$150,000), NIST GMD will review and consider the publicly available information about that applicant in the Federal Awardee Performance and Integrity Information System (FAPIIS). An applicant may, at its discretion, review and comment on information about itself previously entered into FAPIIS by a Federal awarding agency. As part of its review of risk posed by applicants, NIST GMD will consider any comments made by the applicant in FAPIIS in making its determination about the applicant's integrity, business ethics, and record of performance under Federal awards. Upon completion of the pre-award risk assessment, the Grants Officer will make a responsibility determination concerning whether the applicant is qualified to receive the subject award and, if so, whether appropriate special conditions that correspond to the degree of risk posed by the applicant should be applied to an award.

4. Anticipated Announcement and Award Date

Review of Applications, selection of successful applicants, and award processing is expected to be completed by June 2018. The earliest start date for awards under this NOFO is expected to be August 1, 2018.

5. Additional Information

- a. **Safety.** Safety is a top priority at NIST. Employees and affiliates of award recipients who conduct project work at NIST will be expected to be safety-conscious, to attend NIST safety training, and to comply with all NIST safety policies and procedures, and with all applicable terms of their guest research agreement.
- b. **Notification to Unsuccessful Applicants.** Unsuccessful applicants will be notified by e-mail and will have the opportunity to receive a debriefing after the opportunity is officially closed.
- c. **Retention of Unsuccessful Applications.** All electronic applications, whether successful or unsuccessful, are retained for at least three (3) years in the NIST Grants Management and Information System.

VI. Federal Award Administration Information

1. Federal Award Notices

Successful applicants will receive an award package from the NIST Grants Officer.

2. Administrative and National Policy Requirements

- a. **Uniform Administrative Requirements, Cost Principles and Audit Requirements.** Through 2 C.F.R. § 1327.101, the Department of Commerce adopted Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards at 2 C.F.R. Part 200, which apply to awards in this program. Refer to <http://go.usa.gov/SBYh> and <http://go.usa.gov/SBg4>.
- b. **Department of Commerce Financial Assistance Standard Terms and Conditions.** The Department of Commerce will apply the Financial Assistance Standard Terms and Conditions dated March 31, 2017, accessible at <http://go.usa.gov/xXRxK>, to this award. Refer to Section VII. of this NOFO, Federal Awarding Agency Contacts, Grant Rules and Regulations, if you need more information.
- c. **Pre-Award Notification Requirements.** The Department of Commerce will apply the Pre-Award Notification Requirements for Grants and Cooperative Agreements dated December 30, 2014 (79 FR 78390), accessible at <http://go.usa.gov/hKkR>. Refer to Section VII. of this NOFO, Federal Awarding Agency Contacts, Grant Rules and Regulations, if you need more information.
- d. **Funding Availability and Limitation of Liability.** NIST is funding the program listed in this NOFO from the proceeds of the Public Safety Communications and Electromagnetic Spectrum Auction conducted pursuant to Title VI of the Middle Class Tax Relief and Job Creation Act of 2012, Public Law 112-96 (Feb. 22, 2012). However, NIST issues this notice subject to the appropriations made available under the current continuing resolution funding the Department of Commerce, the Bipartisan Budget Act of 2018, Title IV, Subdivision 3, Section 20101 of Public Law 115-123, February 9, 2018. NIST anticipates making awards for the program listed in this notice provided that funding for Fiscal Year 2018 is continued beyond March 23, 2018, the expiration of the current continuing resolution.

In no event will NIST or the Department of Commerce be responsible for application preparation costs if this program fails to receive funding or is cancelled because of agency priorities. Publication of this NOFO does not oblige NIST or the Department of Commerce to award any specific project or to obligate any available funds.

- e. **Collaborations with NIST Employees.** If an applicant proposes collaboration with NIST, the statement of work should include a statement of this intention, a description of the collaboration, and prominently identify the NIST employee(s) involved, if known. Any collaboration by a NIST employee must be approved by appropriate NIST management and is at the sole discretion of NIST. Prior to beginning the merit review process, NIST will verify the approval of the proposed collaboration. Any unapproved collaboration will be stricken from the application prior to the merit review. Any collaboration with an identified NIST employee that is

approved by appropriate NIST management will not make an application more or less favorable in the competitive process.

- f. Use of NIST Intellectual Property.** If the applicant anticipates using any NIST-owned intellectual property to carry out the work proposed, the applicant should identify such intellectual property. This information will be used to ensure that no NIST employee involved in the development of the intellectual property will participate in the review process for that competition. In addition, if the applicant intends to use NIST-owned intellectual property, the applicant must comply with all statutes and regulations governing the licensing of Federal government patents and inventions, described in 35 U.S.C. §§ 200-212, 37 C.F.R. Part 401, 2 C.F.R. §200.315, and in Section D.03 of the Department of Commerce Financial Assistance Terms and Conditions dated March 31, 2017, accessible at <http://go.usa.gov/xXRxK>.

Any use of NIST-owned intellectual property by a recipient of an award under this announcement is at the sole discretion of NIST and will be negotiated on a case-by-case basis if a project is deemed meritorious. The applicant should indicate within the statement of work whether it already has a license to use such intellectual property or whether it intends to seek one.

If any inventions made in whole or in part by a NIST employee arise in the course of an award made pursuant to this NOFO, the United States government may retain its ownership rights in any such invention. Licensing or other disposition of NIST's rights in such inventions will be determined solely by NIST, and include the possibility of NIST putting the intellectual property into the public domain.

- g. Research Activities Involving Human Subjects, Human Tissue, Data or Recordings Involving Human Subjects Including Software Testing.** Any application that includes research activities involving human subjects, human tissue/cells, or data or recordings from or about human subjects, must satisfy the requirements of the Common Rule for the Protection of Human Subjects (“Common Rule”), codified for the Department of Commerce at 15 C.F.R. Part 27. Research activities involving human subjects that fall within one or more of the classes of vulnerable subjects found in 45 C.F.R. Part 46, Subparts B, C and D must satisfy the requirements of the applicable subpart(s). In addition, any such application that includes research activities on these subjects must be in compliance with all applicable statutory requirements imposed upon the Department of Health and Human Services (DHHS) and other Federal agencies, all regulations, policies and guidance adopted by DHHS, the Food and Drug Administration (FDA), and other Federal agencies on these topics, and all Executive Orders and Presidential statements of policy on applicable topics. (Regulatory Resources: <http://www.hhs.gov/ohrp/humansubjects/index.html> which includes links to FDA regulations, but may not include all applicable regulations and policies).

NIST uses the following Common Rule definitions for research and human subjects research:

Research: A systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. Activities which meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program which is considered research for other purposes. For example, some demonstration and service programs may include research activities.

Human Subject: A living individual about whom an investigator (whether professional or student) conducting research obtains data through intervention or interaction with the individual or identifiable private information.

- (1) *Intervention* includes both physical procedures by which data are gathered and manipulations of the subject or the subject's environment that are performed for research purposes.
- (2) *Interaction* includes communication or interpersonal contact between investigator and subject.
- (3) *Private information* includes information about behavior that occurs in a context in which an individual can reasonably expect that no observation or recording is taking place, and information which has been provided for specific purposes by an individual and which the individual can reasonably expect will not be made public (for example, a medical record). Private information must be individually identifiable (i.e., the identity of the subject is or may readily be ascertained by the investigator associated with the information) in order for obtaining the information to constitute research involving human subjects.

See 15 C.F.R. § 27.102 (Definitions).

- 1) **Requirement for Federalwide Assurance.** If the application is accepted for [or awarded] funding, organizations that have an Institutional Review Board (IRB) are required to follow the procedures of their organization for approval of exempt and non-exempt research activities that involve human subjects. Both domestic and foreign organizations performing non-exempt research activities involving human subjects will be required to have protocols approved by a cognizant, active IRB currently registered with the Office for Human Research Protections (OHRP) within the DHHS that is linked to the engaged organizations. All engaged organizations must possess a currently valid Federalwide Assurance (FWA) on file from OHRP. Information regarding how to apply for an FWA and register an IRB with OHRP can be found at <http://www.hhs.gov/ohrp/assurances/index.html>. NIST relies only on OHRP-

issued FWAs and IRB Registrations for both domestic and foreign organizations for NIST supported research involving human subjects. NIST will not issue its own FWAs or IRB Registrations for domestic or foreign organizations.

- 2) **Administrative Review.** The NIST Human Subjects Protection Office (HSPO) reserves the right to conduct an administrative review¹¹ of all applications that potentially include research involving human subjects and were approved by an authorized non-NIST institutional entity (an IRB or entity analogous to the NIST HSPO) under 15 C.F.R. § 27.112 (Review by Institution). If the NIST HSPO determines that an application includes research activities that potentially involve human subjects, the applicant will be required to provide additional information to NIST for review and approval. The documents required for funded proposals are listed in each section below. Most documents will need to be produced during the proposal review process; however, the Grants Officer may allow final versions of certain required documents to be produced at an appropriate designated time post-award. Research involving human subjects may not start until the NIST Grants Officer issues an award explicitly authorizing such research. In addition, all amendments, modifications, or changes to approved research and requests for continuing review and closure will be reviewed by the NIST HSPO.

- 3) **Required documents for proposal review.** All applications involving human subject research must clearly indicate, by separable task, all research activities believed to be exempt or non-exempt research involving human subjects, the expected institution(s) where the research activities involving human subjects may be conducted, and the institution(s) expected to be engaged in the research activities.
 - a. **Not research determination.** If an activity/task involves human subjects as defined in the Common Rule, but the applicant participant(s) indicates to NIST that the activity/task is not research as defined in the Common Rule, the following information may be requested for that activity/task:
 - (1) Justification, including the rationale for the determination and such additional documentation as may be deemed necessary by NIST to review

¹¹ Conducting an “administrative review” means that the NIST HSPO will review and verify the performing institution’s determination for research not involving human subjects or exempt human subjects research. In addition, for non-exempt human subjects research, the NIST HSPO will review and confirm that the research and performing institution(s) are in compliance with 15 C.F.R. Part 27, which means HSPO will 1) confirm the engaged institution(s) possess, or are covered under a Federalwide Assurance, 2) review the research study documentation submitted to the IRB and verify the IRB’s determination of level of risk and approval of the study for compliance with 15 C.F.R. Part 27, 3) review and verify IRB-approved substantive changes to an approved research study before the changes are implemented, and 4) review and verify that the IRB conducts an appropriate continuing review at least annually.

and/or support a determination that the activity/task in the application is not research as defined in the Common Rule.

- (2) If the applicant participant(s) used a cognizant IRB that provided a determination that the activity/task is not research, a copy of that determination documentation must be provided to NIST. The applicant participant(s) is not required to establish a relationship with a cognizant IRB if they do not have one.

NIST will review the information submitted and may coordinate further with the applicant before determining whether the activity/task will be defined as research under the Common Rule in the applicable NIST financial assistance program or project.

- b. **Research not involving human subjects.** If an activity/task is determined to be research and involves human subjects, but is determined to be *not human subjects research* (or *research not involving human subjects*) under the Common Rule, the following information may be requested for that activity/task:

- (1) Justification, including the rationale for the determination and such additional documentation as may be deemed necessary by NIST to review and/or support a determination that the activity/task in the application is not research as defined in the Common Rule.
- (2) If the applicant participant(s) used a cognizant IRB that provided a determination that the activity/task is research not involving human subjects, a copy of that determination documentation must be provided to NIST. The applicant participant(s) is not required to establish a relationship with a cognizant IRB if they do not have one.

- c. **Exempt research determination with no IRB.** If the application appears to NIST to include exempt research activities, and the performer of the activity or the supplier and/or the receiver of the biological materials or data from human subjects **does not** have a cognizant IRB to provide an exemption determination, the following information may be requested during the review process so that NIST can evaluate whether an exemption under the Common Rule applies (see 15 C.F.R. § 27.101(b), (c) and (d)):

- (1) The name(s) of the institution(s) where the exempt research will be conducted.
- (2) The name(s) of the institution(s) providing the biological materials or data from human subjects.
- (3) A copy of the protocol for the research to be conducted; and/or the biological materials or data from human subjects to be collected/provided, not pre-existing samples (i.e., will proposed research collect only

information without personal identifiable information, will biological materials or data be de-identified and when and by whom was the de-identification performed, how were the materials or data originally collected).

- (4) For pre-existing biological materials or data from human subjects, provide copies of the consent forms used for collection and a description of how the materials or data were originally collected and stripped of personal identifiers. If copies of consent forms are not available, explain.
 - (5) Any additional clarifying documentation that NIST may deem necessary in order to make a determination whether the activity/task or use of biological materials or data from human subjects is exempt under the Common Rule.
- d. **Research review with an IRB.** If the application appears to NIST to include research activities (exempt or non-exempt) involving human subjects, and the proposed performer of the activity has a cognizant IRB registered with OHRP, and linked to their Federalwide Assurance, the following information may be requested during the review process:
- (1) The name(s) of the institution(s) where the research will be conducted.
 - (2) The name(s) and institution(s) of the cognizant IRB(s), and the IRB registration number(s).
 - (3) The FWA number of the applicant linked to the cognizant IRB(s);
 - (4) The FWAs associated with all organizations engaged in the planned research activity/task, linked to the cognizant IRB.
 - (5) If the IRB review(s) is pending, the estimated start date for research involving human subjects.
 - (6) The IRB approval date (if currently approved for exempt or non-exempt research).
 - (7) If any of the engaged organizations has applied for or will apply for an FWA or IRB registration, those details should be clearly provided for each engaged organization.

If the application includes research activities involving human subjects to be performed in the first year of an award, additional documentation may be requested by NIST during pre-award review for those performers, and may include the following for those research activities:

- (1) A signed (by the study principal investigator) copy of each applicable final IRB-approved protocol.
- (2) A signed and dated approval letter from the cognizant IRB(s) that includes the name of the institution housing each applicable IRB, provides the start and end dates for the approval of the research activities, and any IRB-required interim reporting or continuing review requirements.

- (3) A copy of any IRB-required application information, such as documentation of approval of special clearances (i.e., biohazard, HIPAA, etc.) conflict-of-interest letters, or special training requirements.
- (4) A brief description of what portions of the IRB submitted protocol are specifically included in the application submitted to NIST, if the protocol includes tasks not included in the application, or if the protocol is supported by multiple funding sources. For protocols with multiple funding sources, NIST will not approve the study without a non-duplication-of-funding letter indicating that no other federal funds will be used to support the tasks proposed under the proposed research or ongoing project
- (5) If a new protocol will only be submitted to an IRB if an award from NIST is issued, a draft of the proposed protocol.
- (6) Any additional clarifying documentation that NIST may request during the review process to perform the NIST administrative review of research involving human subjects. (See 15 C.F.R. § 27.112 (Review by Institution)).

This clause reflects the existing NIST policy and requirements for Research Involving Human Subjects. Should the policy be revised prior to award, a clause reflecting the policy current at time of award may be incorporated into the award.

If the policy is revised after award, a clause reflecting the updated policy may be incorporated into the award.

For more information regarding research projects involving human subjects, contact Anne Andrews, Director, NIST Human Subjects Protection Office (e-mail: anne.andrews@nist.gov; phone: (301) 975-5445).

h. Research Activities Involving Live Vertebrate Animals. Any application that includes research activities involving live vertebrate animals, that are being cared for, euthanized, or used by participants in the application to accomplish research goals, teaching, or testing, must meet the requirements of the *Animal Welfare Act* (AWA) (7 U.S.C. § 2131 et seq.), and the AWA final rules (9 C.F.R. Parts 1, 2, and 3), and if appropriate, the *Good Laboratory Practice for Non-clinical Laboratory Studies* (21 C.F.R. Part 58). In addition, such applications should be in compliance with the *U.S. Government Principles for Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training*. The Principles and guidance on these Principles are available in the National Research Council's *Guide for the Care and Use of Laboratory Animals*, which can be obtained from National Academy Press, 500 5th Street, N.W., Department 285, Washington, DC 20055, or as a free PDF online at <http://www.nap.edu/catalog/12910/guide-for-the-care-and-use-of-laboratory-animals-eighth>.

(1) Administrative Review. NIST reserves the right to conduct an administrative review¹² of all applications that potentially include research activities that involve live vertebrate animals, or custom samples from, or field studies with live vertebrate animals. If the application includes research activities, field studies, or custom samples involving live vertebrate animals, the applicant will be required to provide additional information for review and approval. In addition, NIST will verify the applicant's determination(s) of excluded samples from vertebrate animals. The documents required for funded proposals are listed in each section below. Some may be requested for a pre-review during the proposal review process; however, the Grants Officer may allow final versions of certain required documents to be produced at an appropriate designated time post-award. If an award is issued, no research activities involving live vertebrate animals shall be initiated or costs incurred for those activities under the award until the NIST Grants Officer issues written approval. In addition, all re-approvals, amendments, modifications, changes, annual reports and closure will be reviewed by NIST.

(2) Required documents for NIST proposal review. *The applicant should clearly indicate in the application, by separable task, all research activities believed to include research involving live vertebrate animals and the institution(s) where the research activities involving live vertebrate animals may be conducted. In addition, the applicant should indicate any activity/task that involves an excluded or custom collection from vertebrate animals, or a field study with animals.*

(a) Excluded Collections from Vertebrate Animals: The requirements for review and approval by an Institutional Animal Care and Use Committee (IACUC) do not apply to proposed research using preexisting images of animals or to research plans that do not include live animals. These regulations also do not apply to obtaining stock or pre-existing items from animal material suppliers (e.g. tissue banks), such as pre-existing cell lines and tissue samples, or from commercial food processors, where the vertebrate animal was euthanized for food purposes and not for the purpose of sample collection.

For pre-existing cell lines and tissue samples originating from vertebrate animals, NIST requires that the proposer provide documentation or the

¹² Conducting an "administrative review" means that the NIST HSPO will review and verify the performing institution's IACUC's approval of research with live vertebrate animals, and confirm that the research and performing institution(s) have an appropriate assurance and are in compliance with applicable regulations. HSPO will 1) confirm the engaged institution(s) possess, or are covered under an applicable assurance, 2) review the research study documentation submitted to the IACUC and verify the IACUC's determination of level of risk and approval of the study for compliance with applicable regulations, 3) review and verify IACUC-approved substantive changes to an approved research study before the changes are implemented, and 4) review and verify that the IACUC receives an annual report for the study and conducts an appropriate continuing review at least every three years.

rationale for the determination that the cell line or tissue is pre-existing and not a custom collection from live vertebrate animals for an activity/task within the proposal. NIST may require additional documentation to review and/or support the determination that the cells and/or tissues from vertebrate animals are excluded from IACUC review.

(b) Custom Collections Harvested from Live Vertebrate Animals: NIST requires documentation for obtaining custom samples from live vertebrate animals from animal material suppliers and other organizations (i.e., universities, companies, and government laboratories, etc.). A custom sample includes samples from animal material suppliers, such as when a catalog item indicates that the researcher is to specify the characteristics of the live vertebrate animal to be used, or how a sample is to be collected from the live vertebrate animal.

(c) Field Studies of Animals: Some field studies of animals may be exempt under the Animal Welfare Act from full review and approval by an animal care and use committee, as determined by each institution. Field study is defined as "...a study conducted on free-living wild animals in their natural habitat." However, this term excludes any study that involves an invasive procedure or that harms or materially alters the behavior of an animal under study. Field studies, with or without invasive procedures, may also require obtaining appropriate federal or local government permits (e.g. marine mammals, endangered species, etc.). If the applicant's institution requires review and approval by an animal care and use committee, NIST will require that documentation to be provided as described below.

(d) For custom collections or studies with live vertebrate animals that require review and approval by an animal care and use committee the following documentation is required:

i. Requirement for Assurance. An applicable assurance for the care and use of the live vertebrate animal(s) to be used in the proposed research is required. NIST accepts three types of assurances, as may be applicable. NIST may request documentation to confirm an assurance, if adequate confirmation is not available through an assuring organization's website. The cognizant Institutional Animal Care and Use Committee (IACUC) where the research activity is located may hold one or more applicable assurances applicable to the research activity that are acceptable to NIST. These three assurances are:

- Animal Welfare Assurance from the Office of Laboratory Animal Welfare (OLAW) indicated by the OLAW assurance number, i.e., A-1234;

- USDA Animal Welfare Act certification indicated by the certification number, i.e., 12-R-3456;
- Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC) indicated by providing the organization name accredited by AAALAC as listed in the AAALAC Directory of Accredited Organizations.

ii. Documentation of Research Review by an IACUC: If the applicant's application appears to include research activities, field studies, or custom sample collections involving live vertebrate animals the following information regarding review by an applicable IACUC may be requested during the application review process:

- The name(s) of the institution(s) where the research involving live vertebrate animals will be conducted and/or custom samples collected;
- The assurance type and number, as applicable, for the cognizant Institutional Animal Care and Use Committee (IACUC) where the research activity is located. [For example: Animal Welfare Assurance from the Office of Laboratory Animal Welfare (OLAW) should be indicated by the OLAW assurance number, i.e. A-1234; an USDA Animal Welfare Act certification should be indicated by the certification number i.e. 12-R-3456; and an Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC) should be indicated by AAALAC.]
- The IACUC approval date for the Animal Study Protocol (ASP) (if currently approved);
- If the review by the cognizant IACUC is pending, the estimated- start date for research involving vertebrate animals;
- If any assurances or IACUCs need to be obtained or established, that should be clearly stated.
- If any special permits are required for field studies, those details should be clearly provided for each instance, or indicated as pending.

If the application includes research activities involving vertebrate animals to be performed in the first year of an award, additional documentation may be requested by NIST during pre-award review for those performers, and may include the following for those research activities, to include field studies and custom sample collections involving live vertebrate animals:

- A copy of the IACUC approved ASP signed by the Principal Investigator;
- Documentation of the IACUC approval indicating the approval and expiration dates of the ASP; and
- If applicable, a non-duplication-of-funding letter if the ASP is funded from several sources.

- If a new ASP will only be submitted to an IACUC if an award from NIST is issued, a draft of the proposed ASP may be requested.
- Any additional clarifying documentation that NIST may request during review of applications to perform the NIST administrative review of research involving live vertebrate animals.

This clause reflects the existing NIST policy for Research Involving Live Vertebrate Animals. Should the policy be revised prior to award, a clause reflecting the policy current at time of award may be incorporated into the award.

If the policy is revised after award, a clause reflecting the updated policy may be incorporated into the award.

For more information regarding research projects involving live vertebrate animals, contact Linda Beth Schilling, Senior Analyst (linda.schilling@nist.gov; 301-975-2887).

3. Reporting

- a. **Reporting Requirements.** The following reporting requirements described in Sections A.01, Reporting Requirements, of the Department of Commerce Financial Assistance Standard Terms and Conditions dated March 31, 2017, accessible at <http://go.usa.gov/xXRxK>, apply to awards in this program:

(1) Financial Reports. Each award recipient will be required to submit an SF-425, Federal Financial Report on a quarterly basis for the periods ending March 31, June 30, September 30, and December 31 of each year. Reports will be due within 30 days after the end of the reporting period to the NIST Grants Officer and Grants Specialist named in the award documents. A final financial report is due within 90 days after the end of the project period.

(2) Performance (Technical) Reports. Each award recipient will be required to submit a technical progress report to the NIST Grants Officer and the NIST Federal Program Officer on a quarterly basis for the periods ending March 31, June 30, September 30, and December 31 of each year. Technical progress reports shall contain information as prescribed in 2 C.F.R. § 200.328 (<http://go.usa.gov/xkVgP>) and Department of Commerce Standard Terms and Conditions, Section A.01 (<https://go.usa.gov/xXRxK>). Reports will be due within 30 days after the end of the reporting period. A final technical report shall be submitted within 90 days after the expiration date of the award, and publication citation information as well as links to publicly available data shall be submitted as soon as they become available. If a recipient's Data Management Plan (DMP) has changed since their last submission of a technical progress report, the recipient must include their revised DMP in the next technical progress report

following the revision to the DMP. The revised DMP must include all the requirements described in Section IV.3.a.(13) of this NOFO.

(3) Patent and Property Reports. From time to time, and in accordance with the Uniform Administrative Requirements (see Section VI.2. of this NOFO) and other terms and conditions governing the award, the recipient may need to submit property and patent reports.

(4) Recipient Integrity and Performance Matters. In accordance with section 872 of Public Law 110-417 (as amended; see 41 U.S.C. 2313), if the total value of a recipient's currently active grants, cooperative agreements, and procurement contracts from all Federal awarding agencies exceeds \$10,000,000 for any period of time during the period of performance of an award made under this NOFO, then the recipient shall be subject to the requirements specified in Appendix XII to 2 C.F.R. Part 200, <http://go.usa.gov/cTBwC>, for maintaining the currency of information reported to SAM that is made available in FAPIIS about certain civil, criminal, or administrative proceedings involving the recipient.

b. Audit Requirements. 2 C.F.R. Subpart F, adopted by the Department of Commerce through 2 C.F.R. § 1327.101 requires any non-Federal entity (i.e., including non-profit institutions of higher education and other non-profit organizations) that expends Federal awards of \$750,000 or more in the recipient's fiscal year to conduct a single or program-specific audit in accordance with the requirements set out in the Subpart. Applicants are reminded that NIST, the Department of Commerce Office of Inspector General, or another authorized Federal agency may conduct an audit of an award at any time.

c. Federal Funding Accountability and Transparency Act of 2006. In accordance with 2 C.F.R. Part 170, all recipients of a Federal award made on or after October 1, 2010, are required to comply with reporting requirements under the Federal Funding Accountability and Transparency Act of 2006 (Public Law No. 109-282). In general, all recipients are responsible for reporting sub-awards of \$25,000 or more. In addition, recipients that meet certain criteria are responsible for reporting executive compensation. Applicants must ensure they have the necessary processes and systems in place to comply with the reporting requirements should they receive funding. Also see the Federal Register notice published September 14, 2010, at 75 FR 55663 available here <http://go.usa.gov/hKnQ>.

4. Award Management and Public Engagement

Publication and Technology Transfer. Each award recipient is expected to present the results of their work in appropriate professional literature and conferences in order to make the findings broadly available. Data supporting any findings or conclusions shall be made available in a manner consistent with the Data Management Plan.

VII. Federal Awarding Agency Contacts

Questions should be directed to the following:

Subject Area	Point of Contact
Programmatic and Technical Questions	E-mail: pscr@nist.gov with 'Point Cloud City' in subject line
Technical Assistance with Grants.gov Submissions	Christopher Hunton Phone: 301-975-5718 Fax: 301-975-6368 E-mail: grants@nist.gov <u>Or</u> www.grants.gov Phone: 800-518-4726 E-mail: support@grants.gov

VIII. Other Information

1. **Personal and Business Information**

The applicant acknowledges and understands that information and data contained in applications for financial assistance, as well as information and data contained in financial, performance and other reports submitted by applicants, may be used by the Department of Commerce in conducting reviews and evaluations of its financial assistance programs. For this purpose, applicant information and data may be accessed, reviewed and evaluated by Department of Commerce employees, other Federal employees, and also by Federal agents and contractors, and/or by non-Federal personnel, all of whom enter into appropriate conflict of interest and confidentiality agreements covering the use of such information. As may be provided in the terms and conditions of a specific financial assistance award, applicants are expected to support program reviews and evaluations by submitting required financial and performance information and data in an accurate and timely manner, and by cooperating with Department of Commerce and external program evaluators. In accordance with 2 C.F.R. § 200.303(e), applicants are reminded that they must take reasonable measures to safeguard protected personally identifiable information and other confidential or sensitive personal or business information created or obtained in connection with a Department of Commerce financial assistance award.

In addition, Department of Commerce regulations implementing the Freedom of Information Act (FOIA), 5 U.S.C. Sec. 552, are found at 15 C.F.R. Part 4, Public Information. These regulations set forth rules for the Department regarding making

requested materials, information, and records publicly available under the FOIA. Applications submitted in response to this Federal Funding Opportunity may be subject to requests for release under the Act. If an application contains information or data that the applicant deems to be confidential commercial information that should be exempt from disclosure under FOIA, that information should be identified, bracketed, and marked as Privileged, Confidential, Commercial or Financial Information. In accordance with 15 CFR § 4.9, the Department of Commerce will protect from disclosure confidential business information contained in financial assistance applications and other documentation provided by applicants to the extent permitted by law.

2. Public Website, Frequently Asked Questions (FAQS) and Webinar

NIST PSCR has a public website (pscr.gov) that provides information pertaining to this Funding Opportunity¹³. NIST anticipates that a “Frequently Asked Questions” section or other resource materials will be maintained and updated on the website as needed to provide additional guidance and clarifying information that may arise related to this Funding Opportunity. Any amendments to this NOFO will be announced through Grants.gov.

Applicants must submit all questions pertaining to this funding opportunity in writing to pscr@nist.gov with ‘Point Cloud City’ in the subject line. Questions submitted to NIST may be posted on pscr.gov. Alternatively, applicants may ask questions during the informational public webinar as described in the next paragraph.

NIST hosted a webinar to provide general information regarding this NOFO, offer general guidance on preparing applications, and answer questions. A second webinar to provide general information regarding the amended NOFO will be hosted by NIST. Scheduling details about the second webinar will be available at pscr.gov. Proprietary technical discussions about specific project ideas will not be permitted and NIST staff will not critique or provide feedback on specific project ideas while they are being developed by an applicant or brought forth during the webinar or at any time before the deadline for all applications. However, questions about the PSIAP, eligibility requirements, evaluation and award criteria, selection process, and the general characteristics of a competitive application can be addressed at the webinar and by e-mail to pscr@nist.gov as described in the previous paragraph. There is no cost to attend the webinar, but participants must register in advance. Participation in the webinar is not required, and will not be considered in the application review and selection process. Additional information on the PSIAP and webinar is available at pscr.gov.

¹³ Refer to Section VII. of this NOFO, Federal Awarding Agency Contacts, Programmatic and Technical Questions, if more information is needed.